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⑩ **CANADIAN PATENT**

⑤4 SKI FOR SNOWMOBILE

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②1 APPLICATION No. 152,481
②2 FILED Sep. 25, 1972 Div'n of Appl'n No. 084,837 filed June 5, 1970

③0 PRIORITY DATE
SUPPLEMENTARY DISCLOSURE filed Sep. 25, 1972

ABSTRACT OF THE DISCLOSURE

A ski for snowmobiles of the type which serves to steer the snowmobile. The underface of the ski is provided with a central longitudinal groove with ground-engaging wear rods on each side of the groove. The longitudinal edges of the ski, in at least a front zone of the latter, are converging towards the back of the ski. The ski is mounted in the usual manner by means of a leaf spring and an inclined control rod, so that the ski, when turned relative to the snowmobile, laterally tilts downwardly on the inside of the turn. Lateral tilting of the ski, when turned, causes selective and deeper ground engagement of the wear rod on the inside of the turn and eventual ground engagement of the longitudinal edge on the inside of the turn, and because of its convergence, it produces a small turning radius resulting in much improved steerability of the snowmobile.

The present application is a division of Canadian Patent Application 084,837 filed June 5, 1970, by the same applicant, and entitled: "ENDLESS TRACK VEHICLE".

The present invention relates to an improved construction of the ski or skis for a snowmobile.

Conventional snowmobiles are dangerous in emergencies, because they do not steer quickly, especially on a hard surface. This is due--at least in part--to the fact that the skis have a tendency to slip laterally when the vehicle is turning.

10 It is accordingly the main object of the invention to provide an improved ski which greatly improves the steerability of a snowmobile.

In the annexed drawings:

Figure 1 is a side elevation of a snowmobile provided with skis in accordance with the invention;

Figure 2 is a side elevation of one embodiment of a ski;

Figure 3 is a top plan view of the ski;

Figure 4 is a front end elevation of the ski; and

Figure 5 is a cross-section of the same ski taken along line 5-5
20 of Figure 3.

In the drawings, like reference characters indicate like elements throughout.

Figure 1 shows one type of snowmobile fitted with steering skis in accordance with the invention.

30 The snowmobile illustrated includes a vehicle body or chassis having a front portion 1 providing a platform 2 and fitted with a front guard wall 3 extended by a transparent windshield 4. The rear portion of the chassis A forms a hood 5 having a top wall 6, side walls 7, a front wall 8 and a back wall 9. The hood 5 is hollow and is opened at its bottom, as shown at 10. The chassis forms foot-rests 11 on both sides of hood 5. A passenger seat 12 is secured on top of the hood 5 and a grab strap 13 secured to the hood 5 extends over the seat to be grasped by the rear passenger. A compartment 14 can be lifted



on its hinges 14' to expose the gas filling cap 47' of a gas tank 47. The vehicle is moved by means of an endless flexible track 29 driven by an engine, not shown, located within the hood 5 and driving a sprocket wheel 37, in turn driving the endless track 29, the latter having its bottom run trained on wheels 45, 45' carried by a sub-frame 28. The hood 5 has a side opening for servicing the engine and transmission and which is normally closed by a cover 70. The engine is started by a kickdown starting lever 80 which extends through a slot 81 made in the hood 5.

10 The front of the vehicle is supported by a pair of ground-engaging steerable skis 15. Each ski 15 is provided with the usual leaf spring suspension 16, which is pivoted at its center for rotation about a transverse horizontal axis at 17 to the lower end of an upwardly and rearwardly inclined control rod 18 rotatably mounted within the snowmobile chassis to steer the ski while laterally tilting the same downwardly in the direction of the turning movement. The control rod 18 for each of the skis, or for one centrally located ski, if only one such ski is provided, is controlled by a suitable steering mechanism (not shown) in turn controlled by a handle 19 carried by the front guard wall 8 and accessible to the driver seated on the front portion of seat 12 with
20 his feet on platform 2 or on foot-rests 11.

In accordance with the invention and for more efficient steering, the ski has at its ground-engaging underface a longitudinally extending central groove 22, while its longitudinal edges are downwardly bent to form flanges 23, preferably reinforced by wear rods 24 secured to the ski and running longitudinally of and inside flanges 23 on each side of central groove 22 and serving to limit the wear along the ski edges when the ski is tilted laterally and running along one edge.

30 The longitudinal edges of the ski are slightly concave, as shown at 25, so that the intermediate portion of the ski is of smaller width than the end portions thereof. The back end 26 of the ski is upwardly curved as well as the front end 27, so that the vehicle can be easily backed up without the rear end digging into the snow. When the ski is turned, one or the other of the wear rods 24 engages the snow

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or ground, resulting in much improved steerability of the vehicle.

The ski is provided at its front end with the conventional front grip handle 28.

Due to the fact that the longitudinal edges and the wear rods of the ski in the zone 15' are converging towards the rear end of the ski, the turning action of the ski, when laterally tilted, is greatly increased compared to a ski with parallel longitudinal edges. Also, the ski has been found to be more self-steering, that it is automatically takes a straight-ahead position when
10 steering handles 19 are released, because of the converging diverging relation between wear rods 24 which extend along and just inside flanges 23. However, this relation imposes a certain drag on the ski.

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SUPPLEMENTARY DISCLOSURE

In the principal disclosure, there is described a ski for snowmobiles which imparts improved steerability to a snowmobile. This supplementary disclosure describes a ski having the same fundamental characteristics as in the principal disclosure but is easier and less expensive to manufacture and which has long wear and does not have the drag of the ski of the principal disclosure.

In the drawings supporting the supplementary disclosure:

Figure 6 is a side elevation;

Figure 7 is a top plan view; and

10 Figure 8 is a cross-section taken along line 8-8 of Figure 7.

The ski 15' is of elongated shape with straight edges 29 and is wider at its front portion than at its back portion, the maximum width being about 6" and the width at the back end portion being about 4". Thus, straight edges 29 are converging towards the rear of the ski. The ski underface is provided with a longitudinally extending central groove 30 and has upwardly curved back end 31 and front end 32 to prevent digging into the snow. The groove 30 is co-extensive with the ski. The front end portion of the ski is provided with the usual hand grip 33. A pair of wear rods 34 extend on both sides of the central groove 30 and
20 are substantially parallel therewith and between themselves, said wear rods being straight when seen in top plan view and having their ends bent to provide offset portions 35 extending through holes 36 and over the top face of the ski, so as to be removably secured to the ski. Wear rods 34 are close to central groove 30 and inwardly spaced from straight edges 29.

The front portions of the wear rods 34 extend partly along the upwardly curved front portion of the ski. The ski is provided with the usual brackets 37 for attaching the ski to the leaf spring 16 by means of the conventional hinged or slider front brackets. Here again,
30 this embodiment has the essential feature of a central groove at the underface of the ski with ribs on each side of the groove and with edges converging towards the rear of the ski, the ribs in this case being provided by the wear rods 34 for selectively engaging the ground when

the ski is turned and, therefore, tilted, and the converging edges selectively engaging the ground for increasing the turning action when the ski is tilted to still a greater degree. Thus, the ski improves the steerability of the snowmobile while there is no drag when the ski is straight ahead, because wear rods are straight and parallel relative to each other and to central groove 22. The ski in accordance with the supplementary disclosure is simple and less expensive to manufacture than the ski of the principal disclosure, mainly because of the elimination of the concave sides 25 and the downward flanges 23 of the ski of the principal disclosure.

10

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED, ARE DEFINED AS FOLLOWS:-

1- A steerable ski for a snowmobile equipped with ski mounting means which cause, when the ski is turned relative to the snowmobile, lateral tilting of the ski downwardly on the inside of the turn, comprising an elongated sheet metal member having an upwardly inclined front end portion and having an underface defining a central longitudinally extending groove, said member having longitudinal edges which, at least in the front portion of the ski, are converging towards the rear end of the ski, and a pair of spaced wear rods secured to said member and extending longitudinally of the member and protruding from the underface thereof on each side of said longitudinal groove.

2- A steerable ski as claimed in claim 1, wherein the longitudinal edges of said member are provided with downwardly extending flanges and said wear rods are disposed inside said flanges and against the same, said wear rods converging towards the rear end of the ski in the front portion of the ski.

3- A steerable ski as claimed in claim 1, wherein the intermediate portion of the member has a smaller width than the end portions thereof and said longitudinal edges are provided with downwardly extending flanges and said wear rods are disposed inside said flanges and abut the same throughout the length of the ski, whereby they have a converging diverging relation.

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CLAIM SUPPORTED BY THE SUPPLEMENTARY DISCLOSURE

1SD- A steerable ski for a snowmobile equipped with ski mounting means which cause, when the ski is turned relative to the snowmobile, lateral tilting of the ski on the inside of the turn, comprising an elongated sheet metal member having an upwardly inclined front end portion and having an underface defining a central longitudinally extending groove and flat marginal portions on each side of the groove, said member having straight longitudinal edges converging from the front end portion to the rear end of the ski and a pair of spaced parallel wear rods secured to said member and extending along and protruding from the respective flat marginal portions and parallel to and equally spaced from and on each side of the longitudinal groove of said member, said rods inwardly spaced from said longitudinal edges, and means for securing a leaf spring to the ski, whereby lateral tilting of the ski, when turned, causes selective and deeper ground engagement of the wear rod on the inside of the turn than the wear rod on the outside of the turn, and further lateral tilting of the ski due to further turning movement causes ground engagement by the longitudinal edge on the inside of the turn and thus gives a smaller turning radius than would be produced by the wear rod on the inside of the turn due to the inclination between the wear rod and the longitudinal edge of the member.



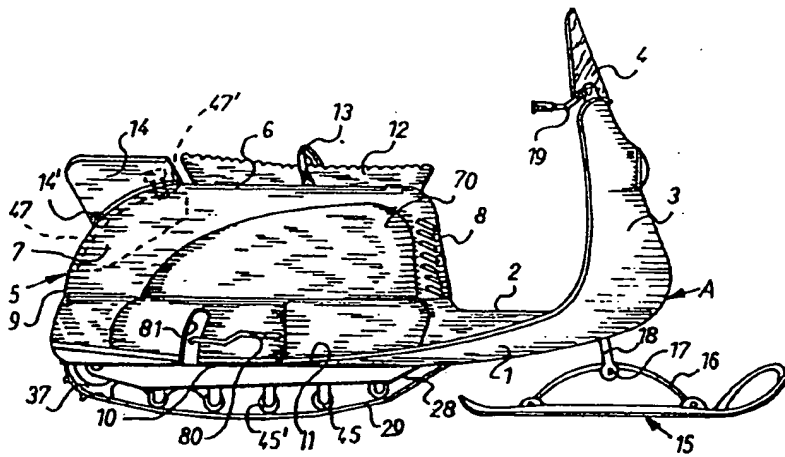


FIG. 1

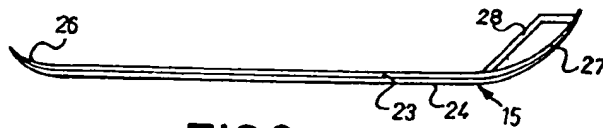


FIG. 2

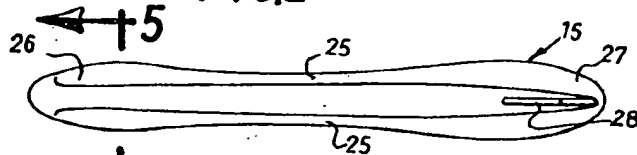


FIG. 3

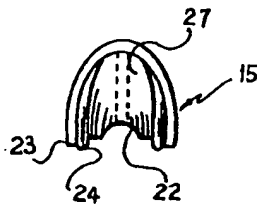


FIG. 4

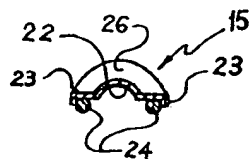
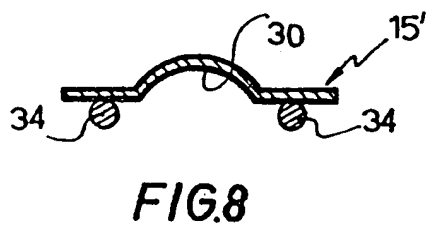
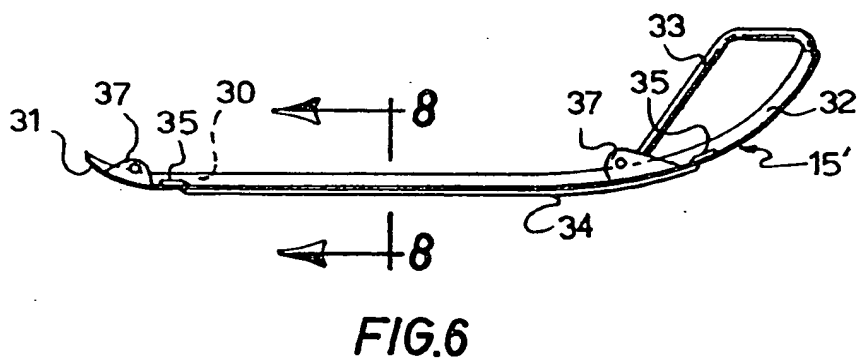
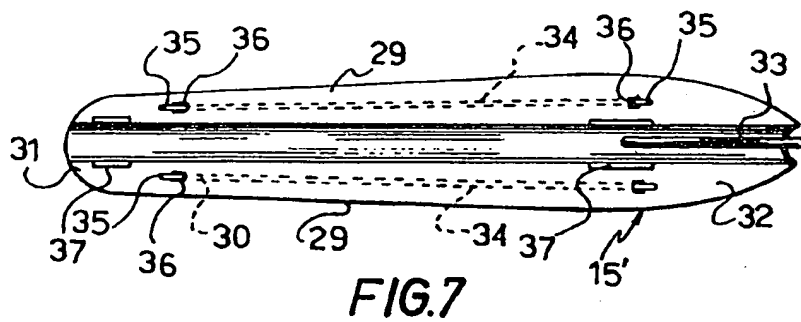


FIG. 5

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